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48. Chromosome observation in Japanese ants

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Since there have been made only a few studies on the chromosomes of ants, taxonomists could not utilize cytological data in evolutionary considerations of this insect. The present authors made an attempt to coordinate karyological data with problems of ant phylogeny. As the first step, the authors made a detailed analysis of their chromosomes by using the hyaluronidase-aceto-orcein squash method in combination with the drying-method, and obtained suitable preparations. The present paper reports the chromosome numbers of 22 Japanese species belonging to 4 subfamilies (Table 1).

From these results, it became clear that the variation of the chromo-

Table 1. Chromosome numbers of Japanese ants.

Subfamily PONERINAE		n	2n
<i>Brachyponera luteipes</i> SMITH.....	11	22	
<i>Cryptopone sauteri</i> WHEELER.....			28
Subfamily DOLICHODERINAE			
<i>Iridomyrmex itoi</i> FOREL	14	28	
Subfamily MYRMICINAE			
<i>Pheidole fervida</i> SMITH.....	10	20	
<i>Monomorium pharaonis</i> LINNÉ	11		
<i>Pristomyrmex pungens</i> MAYR	12	24	
<i>Leptothorax spinosior</i> FOREL		24	
<i>Crematogaster laboriosa</i> SMITH		26	
<i>Tetramorium caespitum jacoti</i> WHEELER	14	28	
<i>Aphaenogaster</i> sp.	16		
<i>Aphaenogaster famelica</i> SMITH	17	34	
<i>Vollenhovia emeryi</i> WHEELER.....		36	
<i>Messor aciculatum</i> SMITH.....	22	44	
Subfamily FORMICINAE			
<i>Camponotus</i> sp.....	9	18	
<i>Camponotus kiusiuensis</i> SANTSCHI		28	
<i>Camponotus japonicus</i> MAYR	14		
<i>Lasius niger</i> LINNÉ		30	
<i>Lasius talpa</i> WILSON.....		30	
<i>Formica sanguinea</i> LATREILLE	26	52	
<i>Formica truncorum yessensis</i> FOREL	26	52	
<i>Formica japonica</i> MOTSCHULSKY	27	54	
<i>Polyergus samurai</i> YANO.....	27	54	

some numbers is very wide among the genera of the same subfamily, namely, from $n = 4$ to $n = 27$ (including the data of PEACOCK *et al.* (1954) and HAUSCHTECK (1961, 1962)). Striking heteroploidy has been developed in two subfamilies, Formicinae ($n = 8 \sim 27$) and Myrmicinae ($n = 4 \sim 22$). Based on this fact, it is presumed that both subfamilies evolved independently from a very early evolutionary stage in the direction toward increasing the chromosome number and developing heteroploidy. This assumption agrees with the opinion of BROWN (1954) who divided the family Formicidae into two large groups based on morphological traits, *i.e.*, Poneroid-complex including Myrmicinae and Myrmecioid-complex including Formicinae. The assumption is also supported by their wide distribution and mode of reproduction. WHEELER (1928) thought that the origin of ants is tropical, but both those subfamilies became distributed all over the world. Therefore it may be assumed that the heteroploidy occurred in various genera, one after another, in the course of their migration to new environments. At the same time, their complicated system of parthenogenetical reproduction (haploid or diploid parthenogenesis of eggs laid by the queen or especially by the workers) may have also contributed to the development of heteroploidy as know in many other parthenogenetical animals.